SACO-LOWELL SPOOLERS

AS BUILT AT
IDDEFORD, MAINE

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TEXTILE MACHINERY

WITH SPECIAL REFERENCE TO THE

SPOOLERS

BUILT BY SACO-LOWELL SHOPS

AT BIDDEFORD, MAINE

FIRST EDITION

SACO-LOWELL SHOPS

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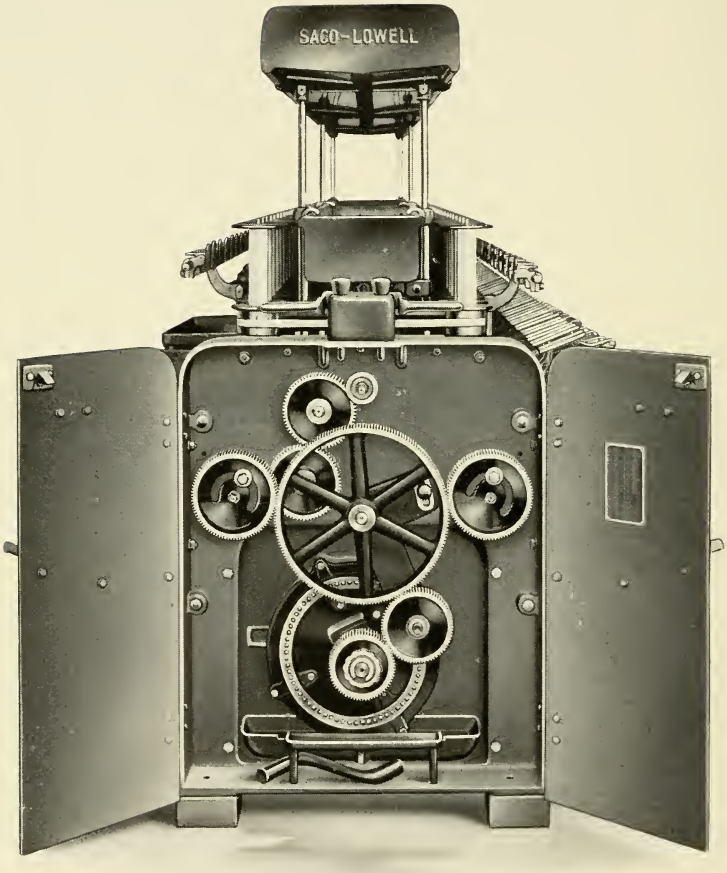

SAGO-LOWELL

Saco-Lowell Spooler

THIS design combines a suitable structure to enable a satisfactory spool to be built, with wide adjustment for shape and size of product.

A machine readily manipulated by the help, accessible and easily kept clean and operative.

Dependable stability of traverse-motion mechanism together with sound, durable construction of all wearing parts.

THE DRIVE OF THE SPOOLER.

The drive of the spooler is from the foot end and may be driven from either above or below. Driving from the foot end enables free access to the inside of the head end, which encloses the head-end bearings, the cut-gear traverse-motion and universal mangle wheel. These parts are tightly enclosed by the finished head-end casting and by the steel doors, which may be opened wide or lifted out of their hinges, as desired. These doors are arranged so that the frame can not be started while either is open, nor can the doors be opened while the frame is in operation. The mangle wheel and its attachments are thus simply and easily accessible without crawling under the frame or reaching in behind rails or rods of any kind; and change gears are immediately accessible without removing guards. The chief function of this head-end arrangement, in addition to the accessibility thus given, is in its complete protecting of the mangle wheel and traverse device, from lint and yarn accretions. The lubrication mentioned hereafter is also another achievement enabled by this arrangement.

TRAVERSE MOTION.

The traverse motion is transmitted through gears entirely.

The principle of the rack and pinion is the best device to fulfill the requirements of a satisfactory spooler traverse motion. In our new spooler, the traverse of thread guide rods is accomplished by two shafts running the full length of the frame and carrying lifting pinions enclosed in the samsons, to raise and lower the lifter rods. These rods are racks and are cut to mesh with the pinions of the lifter shaft. Each lifter rack is enclosed by the hollow leg of a samson and entirely protected from obstruction, and in addition is connected, through the medium of the lifter shaft, with all the lifter racks on that side, so that as the traverse falls each rack is positively driven downwards. A release of the whole drive of each side is provided, however, so that no breakage is possible from an obstructing spool or bobbin placed under the falling thread guide rod. Of course the racks are positively driven upwards, and, with the condition noted, descend jointly, by gravity.

SETTING OF THE TRAVERSE MOTION.

The securing of proper position of the thread guides in relation to spool heads is accomplished by the adjustment on head-end lifter shaft gears (see inside head end), whereby the traverse on either side is adjusted independently in relation to head-end mechanism without disturbing setting of mangle.

THE MANGLE WHEEL.

The mangle wheel is of high-grade construction. In the head end an oil pan is placed, into which the mangle wheel dips at each oscillation, effectually oiling not only the mangle wheel and its pins, but also the traveller gear. A distinctive feature of our new mangle wheel is its adjustable hub by means of which the crown or barrel of spool may be varied to meet general mill conditions and changes arising from change in size of yarn. This feature, as well as several other new developments, have patents pending.

THE TRAVELLER GEAR.

The traveller gear is made of steel, case-hardened, and has bearings with a wearing surface several times as great as ever used on such parts where the gear slides back and forth in a guide while following the contour of the mangle wheel.

SAMSON FEET.

The feet of each samson are fitted with a special levelling device in the form of a jack nut, which nut when turned raises or lowers the frame and is held in the desired position by a suitable fastening. This device permits relevelling of the frame at any time without removing lag screws from the floor, and is a valuable feature.

THE LOWER FRAME RODS.

The lower frame rods are raised high from the floor to enable free and easy mopping and sweeping under them.

THE SPINDLES.

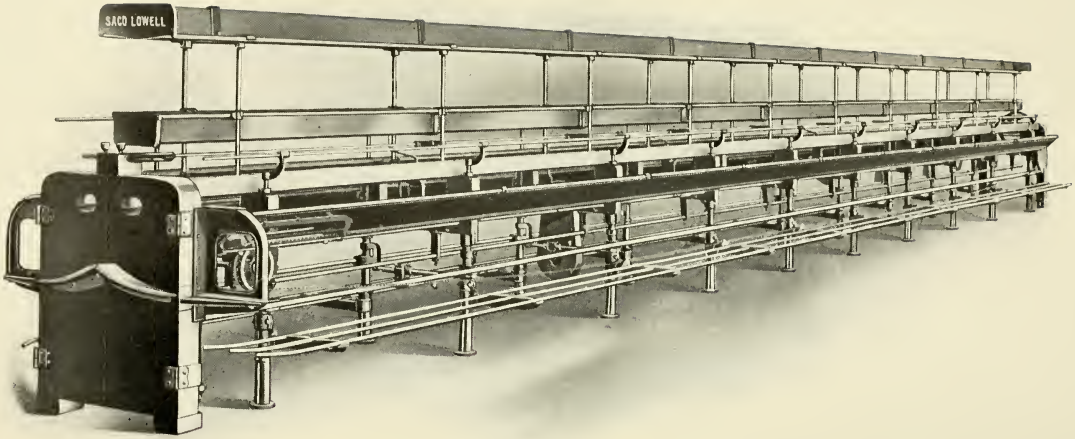
The spindles have been shortened and more ballast has been added to the whirl to ensure steadiness and obviate a doffer guard. Its construction with an enlarged blade is refined and satisfactory from every point of view. Diameter of band whirl is $1\frac{3}{4}''$. Diameter of tape whirl is $3\frac{1}{8}''$.

METAL CONSTRUCTION.

Metal construction is used throughout on our new spooler.

BOBBIN BOXES.

Bobbin boxes are made with rounded corners to prevent accumulation of lint or dirt.



Model 4 (see page 15)

CAREFUL DUPLICATION.

Careful duplication is obtained for all parts through accurate jig work. All parts are strictly interchangeable.

THE USE OF CLAMPS AND SAFETY-SET SCREWS.

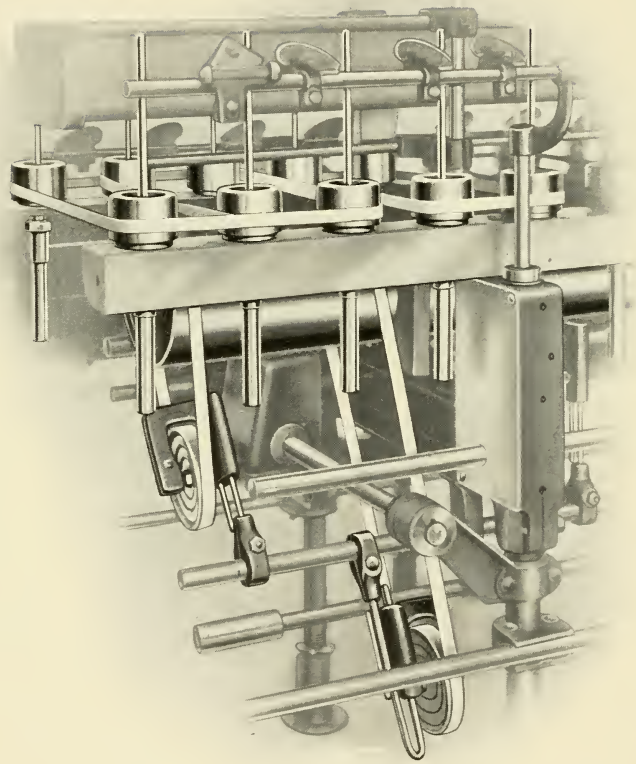
The use of clamps is extensive on this machine, as all adjustments are of this type and there is not an obstructive set screw on the frame, either on moving or stationary parts. The use of the new hollow, safety-set screw is an attractive feature on our new spooler.

OILING.

Oiling is especially provided for throughout the frame by oil tubes which are freely used to make all oil holes accessible.

PULLEY GUARD.

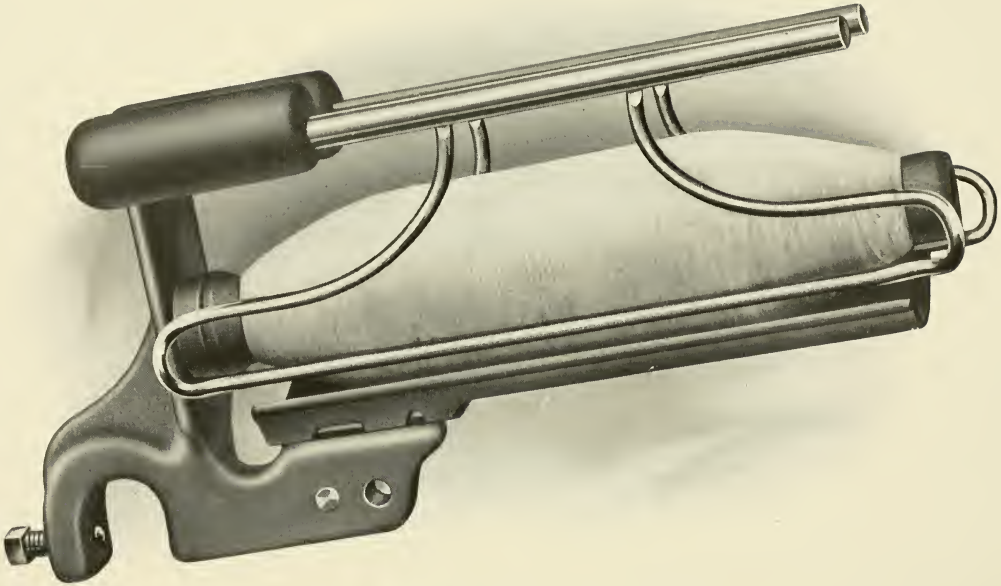
A neat and durable pulley guard and novel shipper are provided, each made and applied in a satisfactory manner to the driving-end structure, and meets all belt angles.



Tape Drive

AFTER long experiments in connection with tape drive on spoolers, we are in a position to strongly recommend the use of such a spindle drive.

The old difficulties of slack, overloaded bands, with spindles running at almost any speed (some stopped altogether) have been entirely overcome with this new arrangement. We use an 8″ diameter cylinder and a 3⅛″ whirl with the tape drive. These extreme diameters enable the use of a very light weight on the idler sheave, which removes any bothersome element of wear; sheave bearings and tapes lasting almost indefinitely, so long at least that as yet in our observations and experiments we have not seen any wear out. We believe, for the above reasons alone, the extra cost per spindle is amply repaid, but in addition, in the field of converting from filling-wound warp bobbins (of which we speak later) this type of drive has been invaluable, enabling uniform speeds and ensuring firm-wound spools.



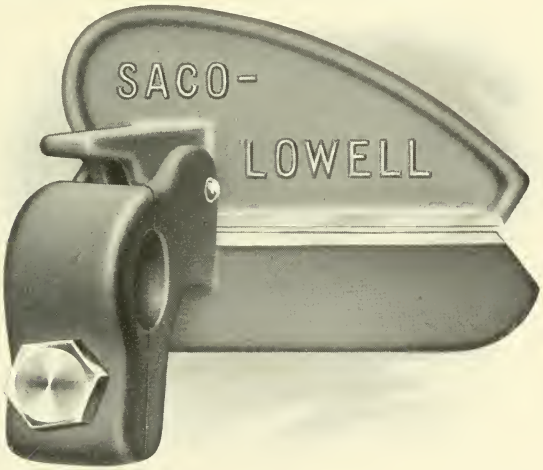
Saco–Lowell Standard Bobbin Holder

Saco-Lowell Standard Bobbin Holder

OUR bobbin holder we have constructed in a manner to give the same strength and long life. The careful balance of the follow wires successfully meets the requirements of this device. These wires are held rigidly in large overhanging balance rods and the rods project long enough so that the same type of bobbin holder can be used for either center or side draw.

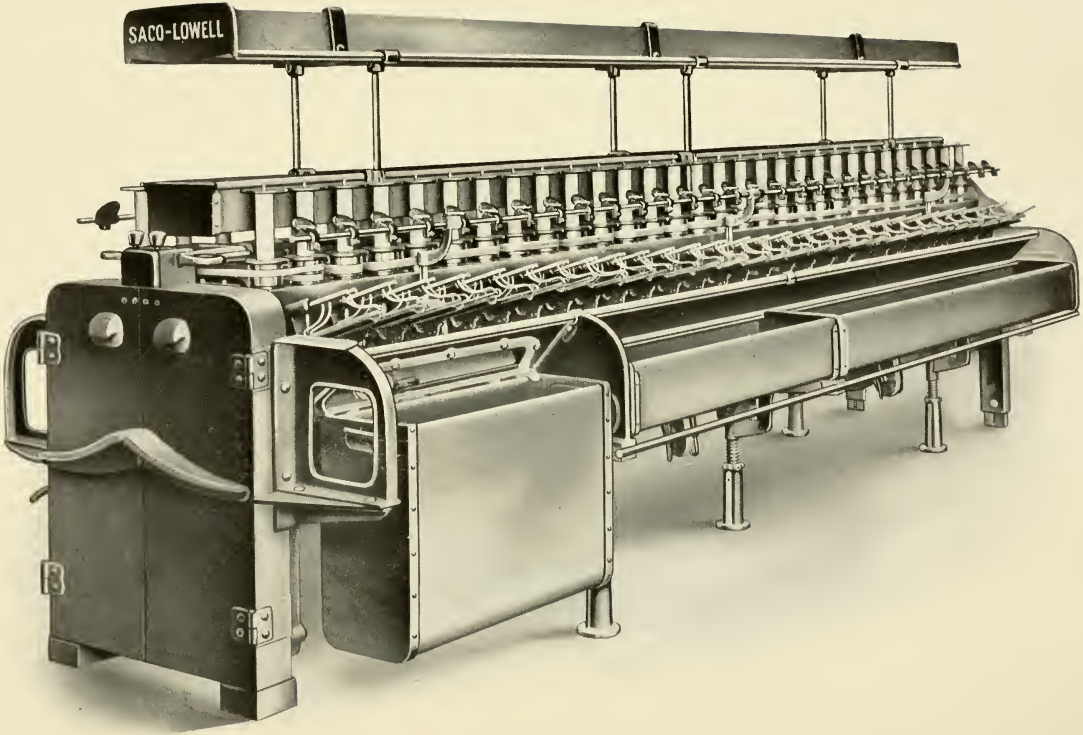
We mount these holders at an angle so that yarn traverses sideways in winding, thereby preventing scoring of thread guide rods and keeping the thread guides clear. We have found this to be a very successful feature of our bobbin holders, both on our own machines and other makes of spoolers where we have applied the same.

These holders are furnished in various sizes.



Saco-Lowell Standard Thread Guides

THE thread guide is a well made guide suitable for finest adjustment, carefully ground and mounted more closely to spool than usual in order to reduce fling of yarn and obtain greater accuracy of wind relative to traverse motion. It is fitted with an adjustment screw requiring a special wrench or key to alter the setting. This wrench may be kept by the overseer or second-hand.



Model 1

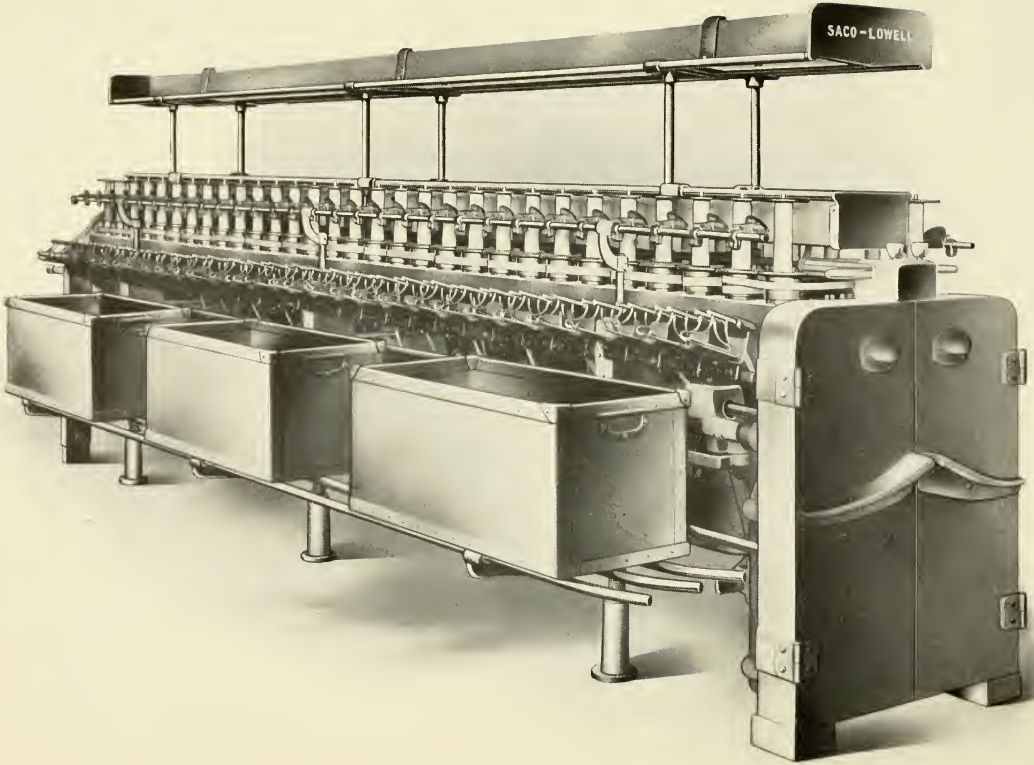
Different Models of Spoolers

MODEL NO. 1.

Model No. 1 comprises a spooler equipped with Saco-Lowell thread guides and bobbin holders (unless special live spindles or skewers are specified), with steel middle boxes and top shelves, side steel boxes and empty bobbin carrier, band spindle drive (unless tape drive is specified). With this arrangement of spooler the empty bobbins are collected in a chute and carried to the head end by means of an endless-chain traveller with lugs on it, and are there deposited in sheet-metal boxes from which the bobbins are collected periodically and returned to spinning room. This model of Spooler is very much in demand.

MODEL NO. 2.

Model No. 2 comprises a spooler equipped with Saco-Lowell thread guides and bobbin holders (unless live spindles or skewers are specified), with steel middle boxes and top shelves and with the side boxes made of steel without empty bobbin carrier. This arrangement is not often specified to-day, though we have occasional calls for the same. This description refers to the arrangement of long steel side boxes, running from one end of the spooler to the other; built in sections, same length as ordinarily furnished with Model No. 1, but the empty bobbin carrier is left off. This arrangement provides receptacles for holding supply and empty bobbins, but we consider that the system of spooling is handicapped by this arrangement, as the empty and full bobbins are in a more or less mixed condition at all times.

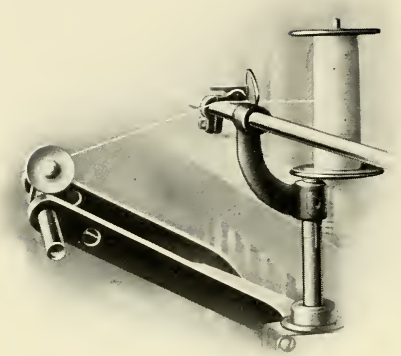


Model 3

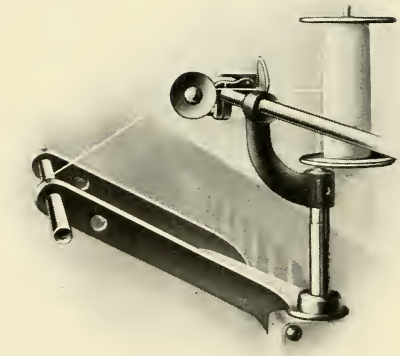
MODEL NO. 3.

Model No. 3 comprises a spooler equipped with Saco-Lowell thread guides and bobbin holders (unless live spindles or skewers are specified), steel middle boxes and top shelves, and adjustable side shelves arranged for supporting portable side boxes. This system in many cases saves in the handling of bobbins over the system employing the empty bobbin carrier, and in many cases it is probably the best system. Greater cleanliness and greater economy in handling product is possible with the portable side boxes. The side boxes that are used with this arrangement are furnished by the mill, and are usually the boxes which are used in handling the full and empty supply bobbins between spinning or twister room and the spooler room, the same boxes being placed on the spooler shelves containing full bobbins, the empty bobbins being thrown into empty boxes placed alternately on shelves. With this arrangement the empty bobbins are returned to the spinning or twister room, in the same boxes in which a full supply is sent in to the spooler room.

There are mills who prefer to have the empty bobbin carrier, at the same time using portable side boxes. Our spooler is so arranged that the same can be applied if desired. A spooler with this equipment (Model No. 4) is shown on page 6.



A



B

Spooling from Filling-Wound Warp Bobbins

BOBBIN HOLDER CONDITIONS.

With bobbin holders the amount of tension is in proportion to speed and weight of bobbin, together with part control by follow wires. The size spinning package, that it is possible to use otherwise with various numbers of yarn, is sometimes limited in order to meet above conditions. In some cases on fine numbers and average numbers of yarn many of our customers believe that the possible speeds and size of package do not result economically.

FILLING-WIND TENSION DEVICES.

To meet the demand that there is for a successful controlling device for converting from filling-wound supply bobbins, we have for the past few years experimented on all existing devices that we know of, and have other devices which we consider to be wholly new applications for securing a satisfactory tension.

In England and on the Continent filling or cop wound bobbins are used almost wholly, and though this is so, there are none of the English devices which seem to be popular or desirable under American conditions.

Without taking the space to fully describe in detail the various devices we have worked upon for this purpose, we will refer simply to two applications of one device, which we have used on our spooler.

Application "A" shows the disc form of tension device applied to an outer rod — skewer for bobbin being located diagonally above empty bobbin return chute.

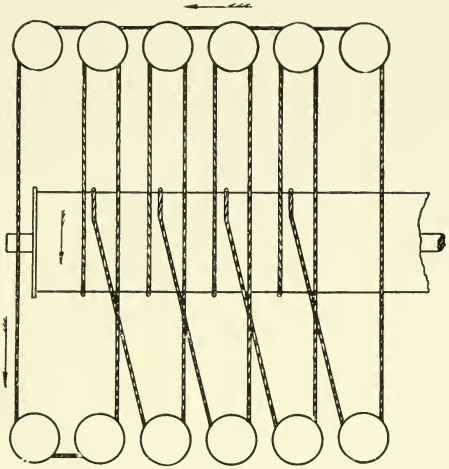
Application "B" shows this same device attached in a more preferable manner to the thread guide rod — skewer being placed in a similar position as in application "A." We have applied a great many of this device on various makes of spoolers, and we shall be glad to furnish samples for trial application to mills interested.

We are fully equipped to go into the above subject broadly with any prospective customer.

SPOOLER TRAVERSES

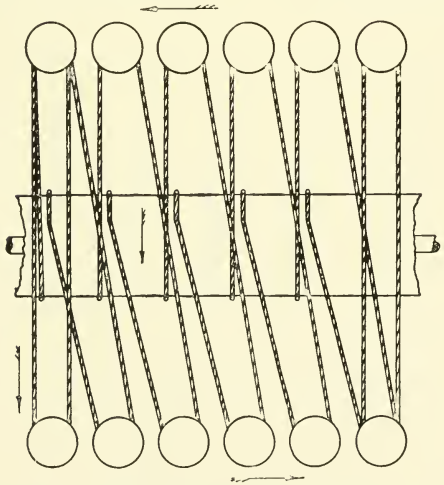
Gears	Actual Traverse	Spool	Gears	Actual Traverse	Spool
40	$3\frac{19}{64}$	$3\frac{1}{2}$	66	$5\frac{15}{32}$	$5\frac{3}{4}$
41	$3\frac{25}{64}$	. . .	67	$5\frac{9}{16}$	. . .
42	$3\frac{15}{32}$	. . .	68	$5\frac{41}{64}$	. . .
43	$3\frac{9}{16}$	$3\frac{3}{4}$	69	$5\frac{23}{32}$	6
44	$3\frac{41}{64}$	. . .	70	$5\frac{13}{16}$	. . .
45	$3\frac{23}{32}$	. . .	71	$5\frac{57}{64}$	. . .
46	$3\frac{13}{16}$	4	72	$5\frac{31}{32}$	. . .
47	$3\frac{57}{64}$	. . .	73	$6\frac{1}{16}$	. . .
48	$3\frac{31}{32}$	. . .	74	$6\frac{9}{64}$	. . .
49	$4\frac{3}{64}$	$4\frac{1}{4}$	75	$6\frac{7}{32}$	$6\frac{1}{2}$
50	$4\frac{1}{8}$	. . .	76	$6\frac{5}{16}$	. . .
51	$4\frac{13}{64}$	. . .	77	$6\frac{25}{64}$	. . .
52	$4\frac{19}{64}$	$4\frac{1}{2}$	78	$6\frac{15}{32}$	. . .
53	$4\frac{3}{8}$	. . .	79	$6\frac{35}{64}$	. . .
54	$4\frac{15}{32}$	$4\frac{3}{4}$	80	$6\frac{5}{8}$	7
55	$4\frac{9}{16}$	. . .	81	$6\frac{45}{64}$	. . .
56	$4\frac{41}{64}$	. . .	82	$6\frac{25}{32}$	. . .
57	$4\frac{47}{64}$	5	83	$6\frac{55}{64}$	. . .
58	$4\frac{13}{16}$	. . .	84	$6\frac{15}{16}$	. . .
59	$4\frac{57}{64}$	. . .	85	$7\frac{1}{64}$	. . .
60	$4\frac{31}{32}$	$5\frac{1}{4}$	86	$7\frac{3}{32}$	$7\frac{1}{2}$
61	$5\frac{1}{16}$	. . .	87	$7\frac{11}{64}$	. . .
62	$5\frac{9}{64}$	. . .	88	$7\frac{1}{4}$	. . .
63	$5\frac{7}{32}$	$5\frac{1}{2}$	89	$7\frac{21}{64}$	. . .
64	$5\frac{5}{16}$	. . .	90	$7\frac{13}{32}$	. . .
65	$5\frac{25}{64}$		93	$7\frac{5}{8}$	8

This table etched on brass is attached to inside of door at head end of spooler.



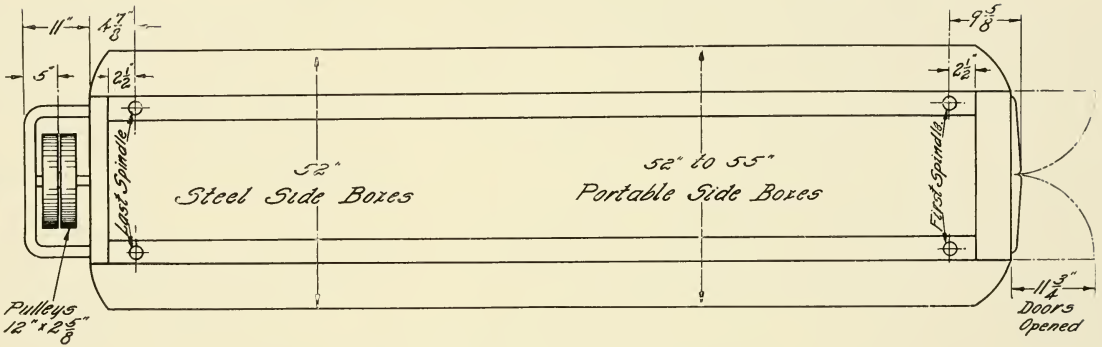
GROUP BAND DRIVE

6–8–10 or 12 spindles may be driven by a single band.



SEPARATE BAND DRIVE

2 spindles may be driven by single band, and at ends the odd spindle driven by extra band.



NOTE — To find over-all length not including opened doors, one half total number of spindles, minus one, multiplied by gauge, plus $25\frac{1}{2}$".

LENGTH OF FRAMES OVER-ALL

GAUGE

No. Sp.	4″	4¼″	4½″	4¾″	5″	5¼″	5½″	5¾″	6″	6¼″	6½″	6¾″	No. Sp.
40	8′–5½″	8′–10¼″	9′–3″	9′–7¾″	10′–0½″	10′–5¼″	10′–10″	11′–2¾″	11′–7½″	12′–0¼″	12′–5″	12′–9¾″	40
50	10′–1½″	10′–7½″	11′–1½″	11′–7½″	12′–1½″	12′–7½″	13′–1½″	13′–7½″	14′–1½″	14′–7½″	15′–1¼″	15′–7½″	50
68	13′–1½″	13′–9¾″	14′–6″	15′–2¼″	15′–10½″	16′–6¾″	17′–3″	17′–11¼″	18′–7½″	19′–3¾″	20′–0″	20′–8¼″	68
70	13′–5½″	14′–2″	14′–10½″	15′–7″	16′–3½″	17′–0″	17′–8½″	18′–5″	19′–1½″	19′–10″	20′–6½″	21′–3″	70
72	13′–9½″	14′–6¼″	15′–3″	15′–11¾″	16′–8½″	17′–5¼″	18′–2″	18′–10¾″	19′–7½″	20′–4¼″	21′–1″	21′–9¾″	72
74	14′–1½″	14′–10¾″	15′–7½″	16′–4½″	17′–1½″	17′–10½″	18′–7½″	19′–4½″	20′–1½″	20′–10½″	21′–7½″	22′–4½″	74
80	15′–1½″	15′–11¼″	16′–9″	17′–6¾″	18′–4½″	19′–2¼″	20′–0″	20′–9¾″	21′–7½″	22′–5¼″	23′–3″	24′–0¾″	80
88	16′–5½″	17′–4¼″	18′–3″	19′–1¾″	20′–0½″	20′–11¼″	21′–10″	22′–8¾″	23′–7½″	24′–6¼″	25′–5″	26′–3¾″	88
90	16′–9½″	17′–8½″	18′–7½″	19′–6½″	20′–5½″	21′–4½″	22′–3½″	23′–2½″	24′–1½″	25′–0½″	25′–11½″	26′–10½″	90
92	17′–1½″	18′–0¾″	19′–0″	19′–11¼″	20′–10½″	21′–9¾″	22′–9″	23′–8¼″	24′–7½″	25′–6¾″	26′–6″	27′–5¼″	92
100	18′–5½″	19′–5¾″	20′–6″	21′–6¼″	22′–6½″	23′–6¾″	24′–7″	25′–7¼″	26′–7½″	27′–7¾″	28′–8″	29′–8¼″	100
110	20′–1½″	21′–3″	22′–4½″	23′–6″	24′–7½″	25′–9″	26′–10½″	28′–0″	29′–1½″	30′–3″	31′–4½″	32′–6″	110
112	20′–5½″	21′–7¼″	22′–9″	23′–10¾″	25′–0½″	26′–2¼″	27′–4″	28′–5¾″	29′–7½″	30′–9¼″	31′–11″	33′–0¾″	112
120	21′–9½″	23′–0¼″	24′–3″	25′–5¾″	26′–8½″	27′–11¼″	29′–2″	30′–4¾″	31′–7½″	32′–10¼″	34′–1″	35′–3¾″	120
124	22′–5½″	23′–8¾″	25′–0″	26′–3¼″	27′–6½″	28′–9¾″	30′–1″	31′–4¼″	32′–7½″	33′–10¾″	35′–2″	36′–5¼″	124
130	23′–5½″	24′–9½″	26′–1½″	27′–5½″	28′–9½″	30′–1½″	31′–5½″	32′–9½″	34′–1½″	35′–5½″	36′–9½″	38′–1½″	130
140	25′–1½″	26′–6¾″	28′–0″	29′–5¼″	30′–10½″	32′–3¾″	33′–9″	35′–2¼″	36′–7½″	33′–0¾″	39′–6″	40′–11¼″	140
150	26′–9½″	28′–4″	29′–10½″	31′–5″	30′–11½″	34′–6″	36′–0½″	37′–7″	39′–1½″	40′–8″	42′–2½″	43′–9″	150
160	28′–5½″	30′–1¼″	31′–9″	33′–4¾″	35′–0½″	36′–8¼″	38′–4″	39′–11¾″	41′–7½″	43′–3¼″	44′–11″	46′–6¾″	160
180	31′–9½″	33′–7¾″	35′–6″	37′–4¼″	39′–2½″	41′–0¾″	42′–11″	44′–9¼″	46′–7½″	48′–5¾″	50′–4″	52′–2¼″	180
182	32′–1½″	34′–0″	35′–10½″	37′–9″	39′–7½″	41′–6″	43′–4½″	45′–3″	47′–1½″	49′–0″	50′–10½″	52′–9″	182
200	35′–1½″	37′–2¼″	39′–3″	41′–3¾″	43′–4½″	45′–5¼″	47′–6″	49′–6¾″	51′–7½″	53′–8¼″	55′–9″	57′–9¾″	200

Production Table for Spooler

THE tables given on opposite page are based on average speeds when converting from warp-wound bobbins, using bobbin holders.

It is of course well known that spooler spindle speeds are varied considerably to meet different classes of work and to be properly balanced to suit both work and operative.

Size of Spool		Number of Yarn	Revolutions per Minute of Spindles			Number of McMullan Spindles to One Spooler Spindle at 820 Revolutions
Length Between Heads	Diameter of Heads		Spindle 740	Spindle 820	Spindle 895	
			Pounds per Spindle per Week			
		8	64.55	71.42	78.19	
		10	51.65	57.14	62.55	12
6	5	12	43.04	47.61	52.12	
		14	36.89	40.81	44.68	
		16	32.28	35.71	39.09	13
		18	29.16	32.72	36.53	
		20	27.50	30.46	34.18	
		22	26.36	29.16	31.92	14
		24	24.16	26.73	29.26	
5	4	26	22.31	24.67	27.01	
		28	20.71	22.91	25.08	15
		30	19.33	21.38	23.41	
		32	18.12	20.05	21.95	16
		34	17.07	18.87	20.65	
		36	14.50	16.04	17.56	17
		38	13.74	15.20	16.64	
$4\frac{1}{2}$	$3\frac{1}{2}$	40	13.05	14.44	15.81	18
		44	13.35	14.77	16.16	19
		50	11.75	12.99	14.22	20
		60	8.99	9.95	10.89	21
$3\frac{1}{2}$	$3\frac{1}{4}$	70	7.71	8.53	9.33	23
		80	6.74	7.46	8.17	25
		90	5.31	5.87	6.43	27
3	$2\frac{3}{4}$	100	4.77	5.28	5.78	30

Ratio cylinder to whirl { band drive 3.33 / tape drive 2.56

STANDARD PULLEYS.

The standard pulleys are $12 \times 2\frac{5}{8}''$ T. & L.

ANY SIZE OF SPOOL.

Any size of spool may be used up to 8″ traverse, $7\frac{1}{2}''$ being the limit as a rule, regular traverses are $3\frac{1}{2}''$, $4\frac{1}{2}''$, 5″, 6″, and $6\frac{1}{2}''$.

DISTANCE BETWEEN SPINDLES.

Distance between spindles was usually determined by adding $\frac{3}{4}''$ to diameter of head of spool. Use of the crowned spool, however, has rendered this figure entirely inadequate for proper working clearances. Much snarl yarn is caused by interference of full spools, as well as by fling of yarn from one spool to another.

PROPER WORKING CLEARANCE.

Proper working clearance between spools requires that from 1″ to $1\frac{1}{4}''$ should be added to diameter of head of spool to give gauge required.

TO FIND OVER-ALL LENGTH OF SPOOLER.

One half total number of spindles, less one, multiplied by gauge, plus $25\frac{1}{2}''$.

STANDARD COLOR.

The standard color is an olive green for body work with small parts black.

SPECIFICATIONS FOR SPOOLERS

For.....No.....Mill
.....
Order date.....To be delivered?.....
Number spoolers this size?.....Number spindles in each machine?.....What gauge?.....Traverse?.....
Standard additional distance added to diameter of spool head for gauge is ¾ inch for straight wind, 1 inch to 1¼ inches for crowned wind. Send sample spool .....
How many machines equipped with Saco-Lowell Bobbin Holders?
.....
How many machines equipped with live spindles?.....
Send sample .....
How many machines equipped with skewers?.....
How many machines equipped with skewers and tension device?
.....
Give exact diameter of back spindle top .....
Send sample .....
Equipped with steel middle boxes and top shelves?.....
Equipped with steel side boxes and empty bobbin carriers? (Model 1).....
Equipped with side shelves without boxes or empty bobbin carriers? (Model 3).....
Ratio of cylinder to whirl 3.33 for band drive; 2.56 for tape drive standard driving pulleys 12 in. × 2⅝ in.....
Belted from above or below?.....
Give traverse of the spinning bobbin .....Twister bobbin .....
Give size of the spinning ring.....
Twister ring.....
Give number of yarn to be spooled .....
Send full bobbin of yarn to be spooled. Tag all samples stating where from.....
Saco-Lowell Thread Guides.....
Unless otherwise ordered, we shall paint these frames green.....
Shipping route.....
Other particulars.....
.....
.....
.....
.....
.....

Catalogue of Parts of Spooler

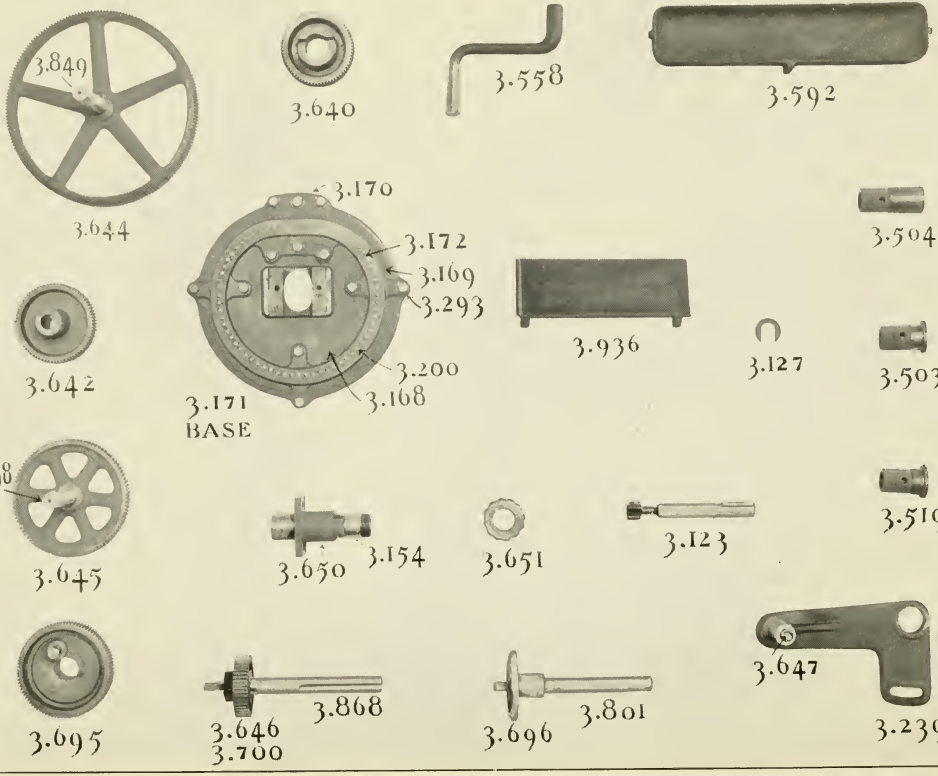
TO BE ORDERED FROM
BIDDEFORD, MAINE

In Ordering Repairs Always State the Following

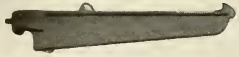
The name and number of the piece as given in the catalogue. If gears are wanted, always give in addition the number of teeth.

The hand of the piece wanted. If there is a right and left hand piece of the same kind, this must also be mentioned.

When a mill has several lots of machinery built at different times please give serial number of frame, also year frames were purchased for which repairs are wanted, as some of the patterns are changed from time to time.


3.849
3.644
3.640
3.558
3.592
3.170
3.172
3.169
3.293
3.200
3.168
3.171
BASE
3.936
3.504
3.642
3.127
3.503
3.198
3.645
3.650
3.154
3.651
3.123
3.519
3.695
3.646
3.700
3.868
3.696
3.801
3.647
3.239

3.849	Large intermediate gear stud.
3.644	Large intermediate traverse gear, 184 teeth.
3.640	79 tooth traverse change gear.
3.558	Crank for H. E. cylinder shaft.
3.592	Head end oil pan.
3.642	Small intermediate traverse gear, 76 teeth.
3.170	Mangle gap block.
3.171	Mangle base piece.
3.172	Mangle tooth binder.
3.169	Mangle flange piece.
3.293	Cap screw bushing for mangle wheel.
3.200	Mangle wheel tooth.
3.168	Mangle center piece.
3.936	Head end drip pan.
3.504	Large intermediate gear stud bearing.
3.127	Mangle stud split washer.
3.503	H. E. traverse motion bushing.
3.198	Traverse motion shaft butt.
3.645	Traverse gear in head end, 96 teeth.
3.650	Mangle hub dog.
3.154	Mangle hub sleeve.
3.651	Mangle hub hand nut.
3.123	Oscillating gear stud.
3.519	Cylinder bearing bushing.
3.695	Head end lifter gear, 90 teeth.
3.646	Cylinder gear inside head end, 48 teeth.
3.700	Cylinder gear inside head end, 64 teeth.
3.868	Band drive butt. With gear.
3.696	Head end lifter gear adjusting piece.
3.801	Lifter shaft butt.
3.647	Intermediate gear hanger stud.
3.239	Intermediate gear swing plate.



3.935

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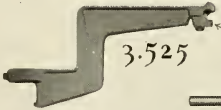

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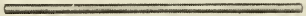
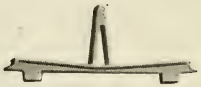


3.104

3.844



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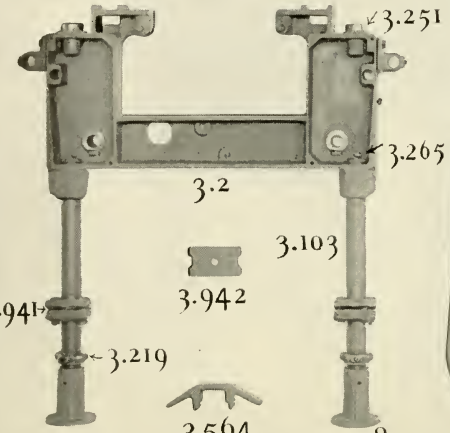

3.251

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3.2

3.103

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3.941

3.219

3.564

3.218

3.566

3.890

3.565

3.935 Bracket for side box, $14\frac{3}{8}$″ wide.
3.694 18 tooth sprocket bobbin return driver.
3.901 Top shelf binder.
3.525 Samson bracket.
3.515 Clamp piece on samson bracket.
3.104 Rod for creel support, 76″ × 19″ long.
3.844 30 tooth sprocket gear.
3.902 Bracket to support top shelf at samson.
3.941 Samson leg clamp piece.
3.2 Samson.
3.219 Samson nut.
3.942 Rod binder for bracket, No. 3.935.
3.103 Samson leg.
3.251 Lifter rack upper bushing.
3.265 Lifter rack lower bushing.
3.564 Samson bracket shoe.
3.218 Samson foot.
3.565 Long model of chain guard.
3.566 Long model of chain guard cover.
3.890 Sprocket chain for traverse motion at No. 3 samson.

3.928L

3.515

3.1115

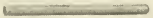
3.997

3.994

3.927R

3.227
3.228

3.945



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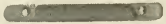

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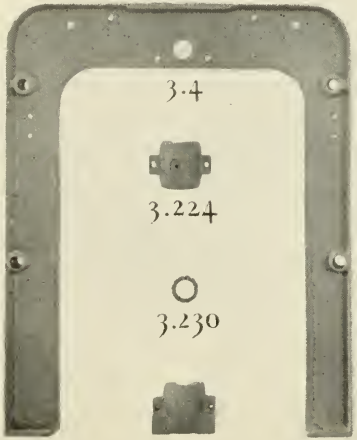

3.4

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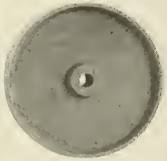


3.236

3.1114

3.1108

3.927	Foot end bracket, right-hand.
3.928	Foot end bracket, left-hand.
3.515	Clamp piece on samson bracket.
3.1115	Clamp piece for shipper circle (oval).
3.997	Shipper rod cross girt.
3.994	Shipper bearing stand.
3.227	Top half of cylinder bushing.
3.228	Bottom half of cylinder bushing.
3.945	Foot end guard rod clamp.
3.895	Short pulley guard rod.
3.1103	Inner shipper rod bearing.
3.4	Foot end.
3.224	Cap for cylinder bearing bracket.
3.230	Oil ring.
3.223	Foot end cylinder bearing bracket.
3.236	12″ tight pulley.
3.237	12″ loose pulley.
3.1114	Outside shipper circle (oval section).
3.1108	Shipper circle without handles.

3.922

3.921

3.571

3.575

3.517

3.923

3.593 R
3.594 L

3.529

3.600

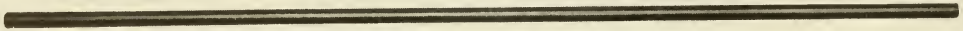
3.572

3.1109 L

3.1117 R

3.288

3.921 End piece for side box, right-hand.
3.922 End piece for side box, left-hand.
3.571 Box end for intermediate side box, right-hand.
3.572 Box end for intermediate side box, left-hand.
3.575 Top box name plate.
3.517 Top box end.
3.923 Partition piece for side box.
3.593 Side box end without bobbin return, right-hand.
3.594 Side box end without bobbin return, left-hand.
3.529 Side box end.
3.600 Partition piece for side box.
3.1109 Head and foot end chute binder, left-hand.
3.1117 Head and foot end chute binder, right-hand.
3.288 Name plate.



3.891

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3.544

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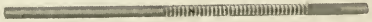


3.105

3.684

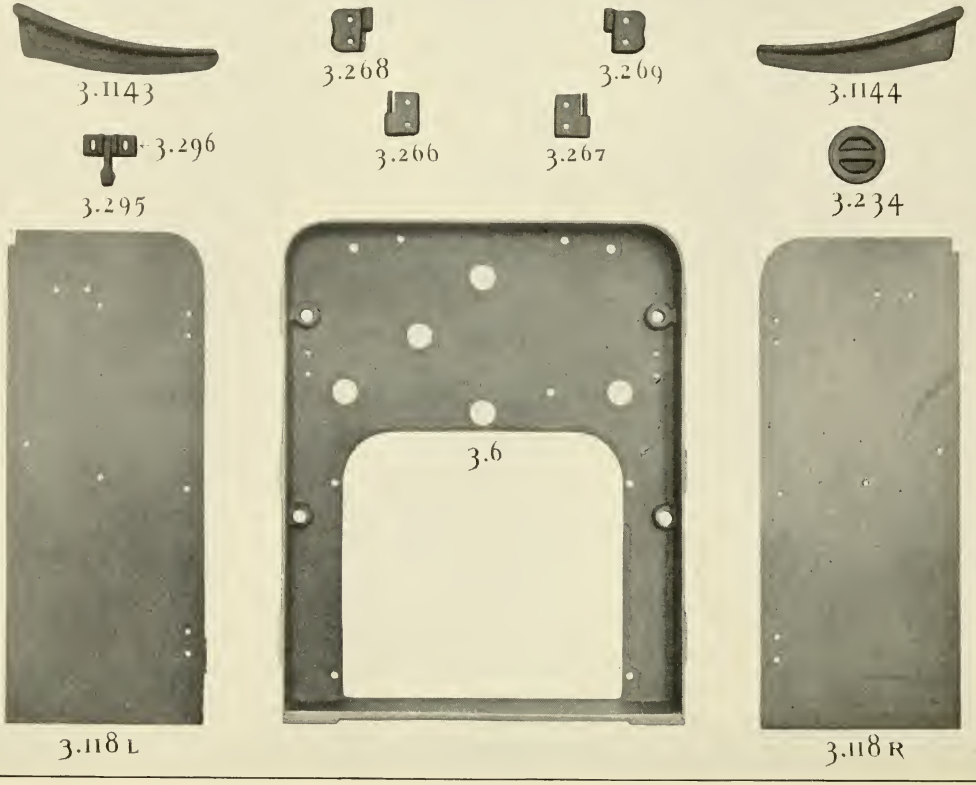
3.265

3.251

3.1119

3.1110

3.891	Lifter shaft.
3.892	Thread guide rod.
3.544	Thread guide rod, holder coupling, 1″ offset.
3.545	Thread guide rod, holder 1″ offset.
3.680	Lifter rack gear, 30 teeth.
3.969	Goose neck, 1″ offset, without set screw.
3.970	Goose neck, 1″ offset, with set screw.
3.910	Oil tube holder.
3.244	Lifter shaft bushing.
3.105	Lifter rack.
3.684	Samson panel.
3.265	Lifter rack lower bushing.
3.251	Lifter rack upper bushing.
3.1119	Samson bobbin holder rod bracket (regular).
3.1110	Samson bobbin holder rod bracket (coupling).


3.1143
3.268
3.269
3.1144
3.296
3.266
3.267
3.295
3.234
3.6
3.118 L
3.118 R

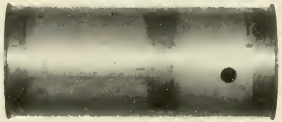
3.1143	Door guard, right-hand.
3.1144	Door guard, left-hand.
3.268	Head end hinge, upper piece, right-hand.
3.269	Head end hinge, upper piece, left-hand.
3.266	Head end hinge, lower piece, right-hand.
3.267	Head end hinge, lower piece, left-hand.
3.296	Door latch swivel.
3.295	Head end door latch.
3.234	Head end door grip.
3.118	Head end door for foot end drive, right and left.
3.6	Head end (deep).

3.893

3.894

3.3

3.256



3.896

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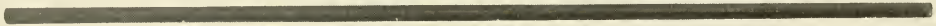
3.876

3.225

3.654

3.893 Lower frame rod.
3.894 Bobbin holder rod.
3.3 Spindle rail.
3.896 8″ cylinder. Tape drive.
3.256 Head for 6¼″ dia. cylinder, coupling, band drive.
3.258 Head for 6¼″ dia. cylinder, outer head end, band drive.
3.259 Head for 6¼″ dia. cylinder, inner head end, band drive.
3.876 Coupling cylinder shaft for band drive.
3.245 1⅛″ collar.
3.654 Foot end cylinder shaft.

3.897



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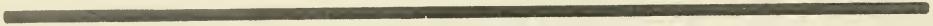

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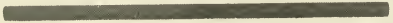
3.909



3.900

3.231

3.297

3.191

3.510

3.580

3.546

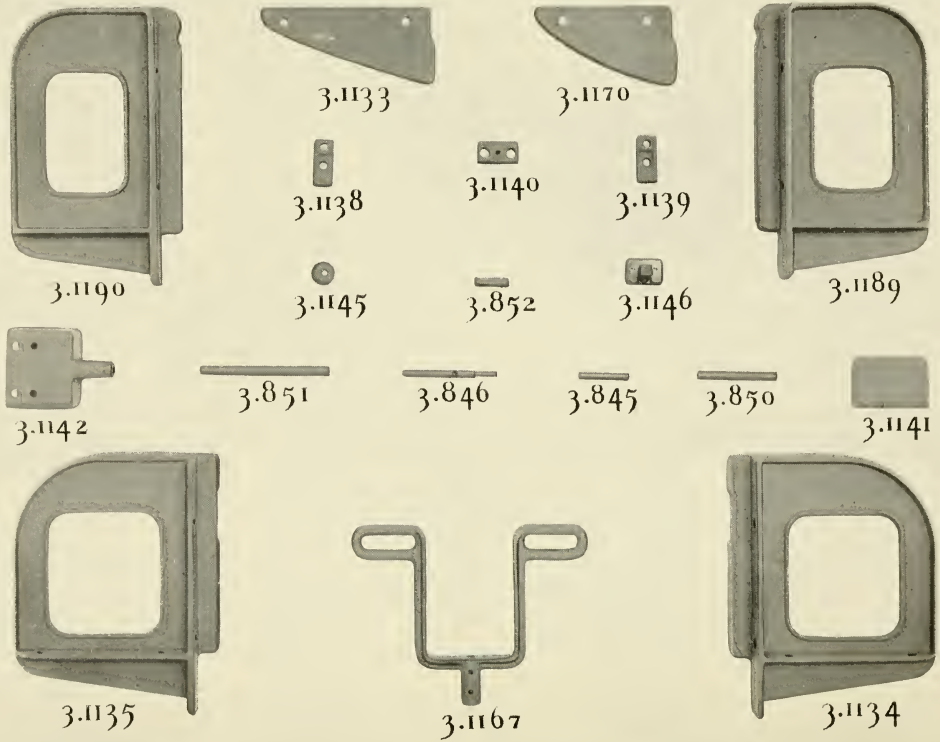
3.555

3.547

3.980

3.897 Traverse motion shaft.
3.898 Oscillating shaft.
3.899 Shelf rods.
3.900 Dead cross shaft.
3.909 Swivel bearing holder.
3.297 Swivel bearing.
3.191 Stud for swivel bearing holder.
3.510 Splined coupling.

3.231 Traverse motion shaft samson bearing.
3.580 Cylinder bearing bracket with traverse motion bearing spots.
3.546 Cross shaft hanger, right-hand.
3.547 Cross shaft hanger, left-hand.
3.555 Clamp piece on cross shaft hanger.
3.980 Traverse motion samson bearing.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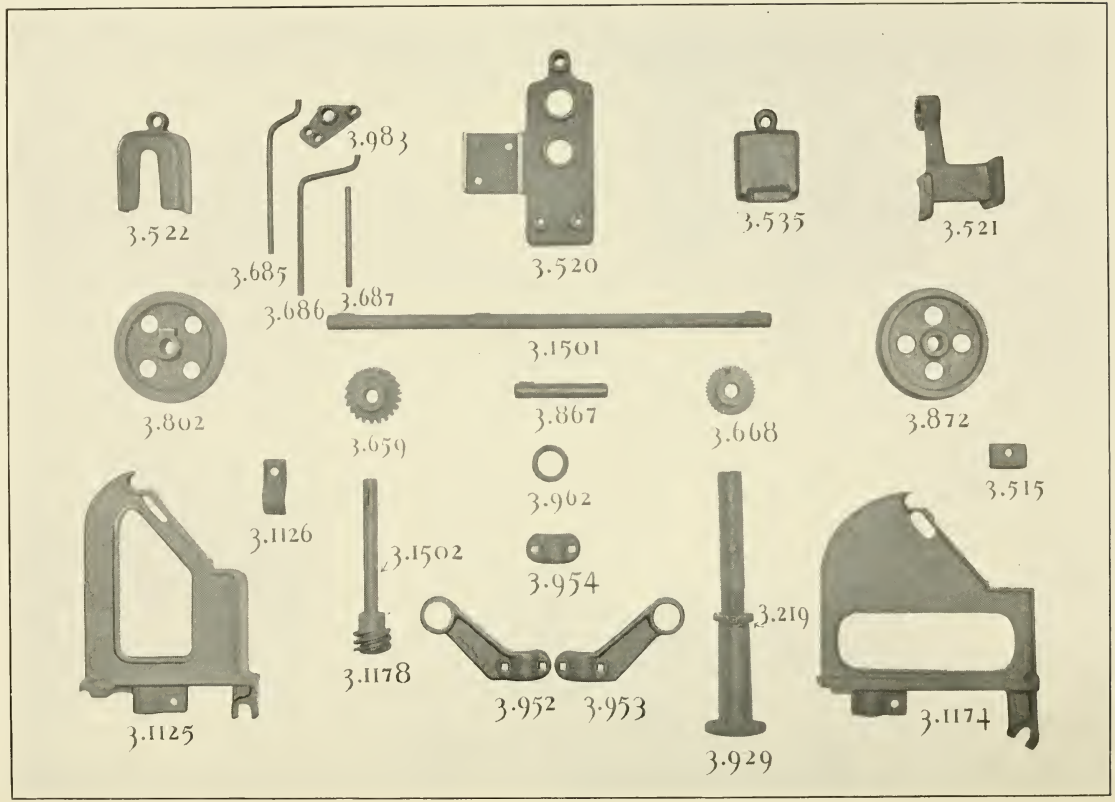
3.1142
3.851
3.846
3.845
3.850
3.1141
3.1135
3.1167
3.1134

3.1189 Head end guard wing, right-hand, narrow.
3.1190 Head end guard wing, left-hand, narrow.
3.1134 Head end guard wing, right-hand, wide.
3.1135 Head end guard wing, left-hand, wide.
3.1133 Head end guard bracket, wide.
3.1170 Head end guard bracket, narrow.
3.1138 Tumbler for head end lock, right-hand.
3.1139 Tumbler for head end lock, left-hand.
3.1140 Slide for head end lock.
3.852 Head end lock cross bar.
3.1145 Knob for head end door latch stud.
3.1146 Door catch for lock stud.
3.1142 Shelf for head end door lock.
3.851 Shipper shaft stud.
3.846 Head end door latch.
3.845 Head end latch slide stud.
3.850 Shipper guide stud.
3.1141 Cover to door lock.
3.1167 Shipper handle.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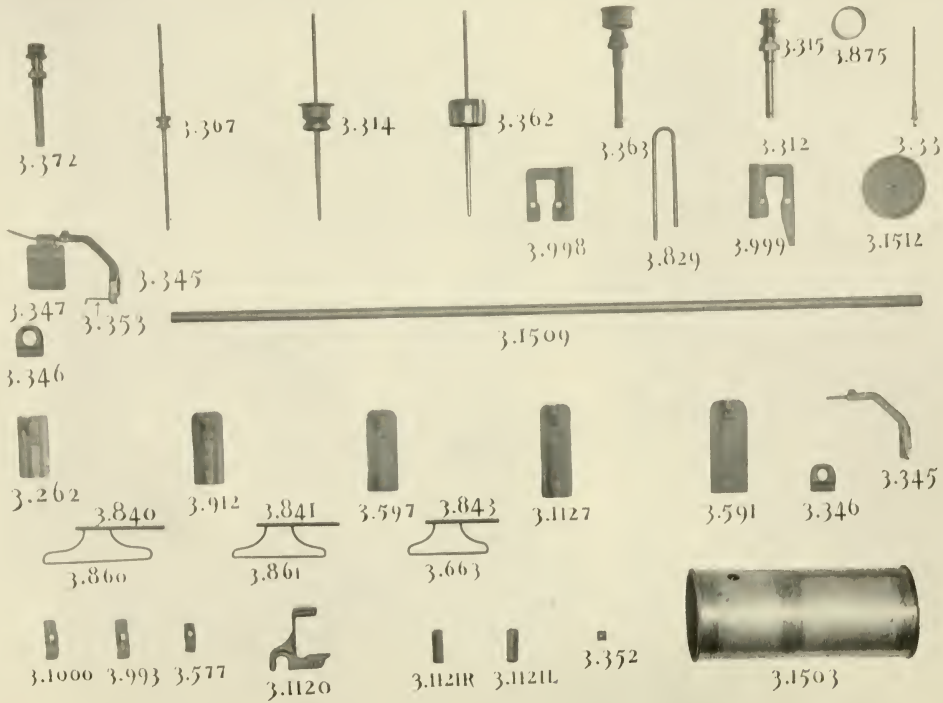
3.668
3.872
3.962
3.515
3.1126
3.1502
3.954
3.1178
3.219
3.952
3.953
3.1125
3.929
3.1174

3.522 Bobbin return motion gear guard.
3.685 Oil tube at No. 1 samson for inner upper. Bearing.
3.686 Oil tube at No. 1 samson for inner lower. Bearing.
3.687 Oil tube at No. 1 samson for outer bearing.
3.983 Oil tube holder at No. 1 samson.
3.520 Bobbin return motion plate.
3.535 Oil pan for bobbin return worm.
3.521 Worm gear bracket.
3.802 Bobbin return sheave.
3.1501 Live cross shaft.
3.872 Foot end bobbin return sheave.
3.659 21 tooth worm gear, triple lead.
3.867-A Stud for foot end bobbin return sprocket.
3.668 38 tooth bobbin return motion gear on traverse motion shaft.
3.1126 Cap for guard rail support.
3.962 Collar for standard bushing.
3.515 Clamp piece on samson bracket.
3.1125 Intermediate chute support bracket.
3.1502 Worm shaft.
3.1178 Triple worm, right-hand.
3.954 Samson live cross shaft bracket cap.
3.952 Samson live cross shaft bracket, right-hand.
3.953 Samson live cross shaft bracket left-hand.
3.103 Samson leg.
3.219 Samson nut.
3.929 Samson foot, $5\frac{3}{4}$″ long.
3.1174 Guard rail support bracket.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3.843
3.663
3.1127
3.591
3.346
3.345
3.1000
3.993
3.577
3.1120
3.1121R
3.1121L
3.352
3.1503

3.372 Light spindle base.
3.367 Live spindle blade.
3.314 Band drive whirl.
3.362 Tape drive whirl.
3.998 Half piece of sheave holder, right-hand.
3.999 Half piece of sheave holder, left-hand.
3.829 Sheave holder fork.
3.363 Tape drive spindle base.
3.312 Band drive spindle base.
3.315 Nut for spindle base for No. 3.312 and No. 3.363.
3.875 Tape drive spindle base. Loose ring.
3.339 McMullan skewer.
3.1512 Tape drive binder pulley.
3.840 Bobbin holder, short stud, 7–7½″.
3.841 Bobbin holder, short stud, 6–6½″.
3.843 Bobbin holder, short stud, 5–5½″
3.860 Bobbin holder, follow wire, 7″ traverse.
3.861 Bobbin holder, follow wire 6″ traverse.
3.663 Follow wire in No. 1 bobbin holder, 5″ to 5½″ traverse.
3.345 Bracket for live spindle for twister bobbins.
3.347 Bobbin friction plate.
3.353 Wire hold down for twister live spindle.
3.346 Clamp piece for bracket, No. 3.345.
3.1509 Shaft for binder pulley bracket, tape drive.
3.262 Bobbin holder friction plate, 4–4½″.
3.912 Bobbin holder friction plate, 5–5½″.
3.597 Bobbin holder friction plate, 6–6½″.
3.1127 Bobbin holder friction plate, 7–7½, 2¼″ ring.
3.591 Bobbin holder friction plate, 7–7½, 3″ ring.
3.1503 6¼″ diameter cylinder, for band drive.
3.1000 Tape drive binder swivel holder.
3.993 Tape drive binder swivel holder.
3.577 Skewer holder.
3.1120 Bobbin holder bracket.
3.1121 Bobbin holder yoke weight, right and left.
3.352 Tape drive binder pulley bearing.

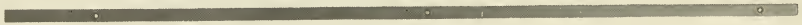
3.527

3.1504

3.1123

3.1505

3.1124



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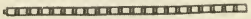

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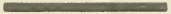

3.1510

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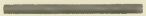

3.1511

3.1187R

3.1188L

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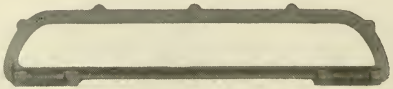


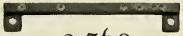
3.1158

3.527 Sliding hanger.
3.1123 Binder holder.
3.1504 Chute, front section.
3.1505 Chute, back section.
3.1506 Chute, shoe section.
3.1124 Cross shaft tension sheave.
3.1507 Bobbin carrier chain.
3.1510 Sliding hanger stud, upper.
3.1511 Sliding hanger stud, lower.
3.855 Chute bead binder.
3.693 Hook for counter weight.

3.360 Deflector holder, right-hand.
3.361 Deflector holder, left-hand.
3.1187 Bobbin deflector with high ridge in center, right-hand.
3.1188 Bobbin deflector with high ridge in center left-hand.
3.1162 Weight for sliding hanger at foot end.
3.528 Slide stud holder.
3.856 Sheet metal fillet for chute.
3.1158 Chute cut out binder.

3.1157

3.583



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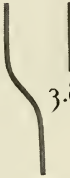

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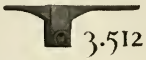

3.512

3.73

3.271

3.1154

3.1157 Head end elevating block.
3.583 Release coupling, long piece.
3.584 Release coupling, short piece.
3.569 Oil tube bracket on head end.
3.286 Oscillating gear guide.
3.141 Long mangle gear stud.
3.238 Collar for 1″ shaft.
3.675 Oil tube in lifter shaft bearing in head end.
3.853 Oil tube in head cylinder bearing.
3.676 Oil tube in large intermediate gear. Bearing in head end.
3.871 Oil tube for intermediate gear.
3.870 Oil tube for traverse motion shaft bearing.
3.512 Oscillating gear bearing.
3.73 Empty bobbin box end, narrow.
3.271 Head end cover.
3.1154 End for bobbin receptacle.

3.30

3.28

3.37

3.18

3.41

3.986

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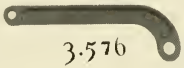
3.827



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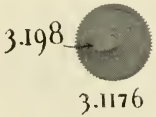

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3.1163

3.1186

3.30	Bobbin return motion bracket at No. 1 samson.
3.28	Traverse motion shaft bracket.
3.37	Collar on cylinder gear hub.
3.18	Bushing for tape drive main shaft, head end.
3.41	Inset skewer holder.
3.986	Tape drive rod holder.
3.29	Short model traverse motion shaft at No. 1 samson.
3.827	12 tooth sprocket for $^{15}/_{16}''$ detachable ch.
3.828	52 tooth sprocket for $^{15}/_{16}''$ detachable ch.
3.576	Skewer rod bracket.
3.1129	Head end door grip.
3.1185	Short model of chain guard.
3.1186	Short model of chain guard cover.
3.1176	66 tooth traverse motion shaft gear.
3.198	Traverse motion shaft butt, long.
3.542	Worm gear guard.
3.1176	66 tooth traverse motion shaft gear.
3.867	Traverse motion shaft butt, short.
3.1163	Sliding adjustable foot, right-hand.
3.1164	Sliding adjustable foot, left-hand.

Index

	Page
Band Drive Diagrams	19
Bobbin Holder	10, 11
Filling-Wound Warp Bobbins	17
Floor Plan	20
Gauge	21, 24
Length of Frames Over-all	21
Lubrication	3, 4, 7
Mangle Wheel	4
Models 1 & 2	12, 13
Models 3 & 4	6, 14, 15
Parts Catalogue	27 to 55
Production Table	23
Ratio Cylinder to Whirl	23
Rule to Find Over-all Length Frame	24
Safety Door Lock	2, 3
Specifications	25
Spindles	5
Spools, Proper Clearance of Heads	24
Tape Drive	9
Tension Devices	16, 17
Thread Guide	11
Traverse Motion	4
Traverse Table	18, 24

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